THAT WHICH IS CLAIMED:

1. A plasma arc torch, comprising:

an electrode including an upper tubular member defining an internal bore therethrough and a metallic holder having a front end and a rear end along a longitudinal axis, the front end having a front face defining a front cavity having at least an emissive element positioned therein, the rear end defining a central passageway in fluid communication with the internal bore for directing gas from the rear end to the front end of the holder, the holder further defining a plurality of side openings positioned proximate the front end of the holder that are in fluid communication with the central passageway;

a nozzle positioned proximate the front end of the holder and defining a nozzle chamber therebetween, said nozzle defining a central bore for discharging a primary flow of gas from the nozzle chamber toward a workpiece located adjacent the nozzle;

an electrical supply for creating an arc extending from the emissive element of said electrode through the central bore and to the workpiece; and

a gas supply line through which all gas used by the torch is supplied, the gas supply line directing all of the gas to the central passageway of said electrode, wherein all of the gas is directed to the nozzle chamber from the central passageway through the side openings defined by the holder.

2. A plasma arc torch according to Claim 1, wherein the nozzle further defines a plurality of secondary openings positioned across the nozzle chamber from the side openings at the front end of the metallic holder, the secondary openings creating a secondary flow of gas therethrough.

3. A plasma arc torch according to Claim 1, further comprising a ball valve assembly located in the internal bore of the upper tubular member, said ball valve assembly capable of regulating the gas through the torch.

4. A plasma arc torch according to Claim 1, further comprising a pressure detecting device in fluid communication with the nozzle chamber, said pressure detecting device disabling the torch if gas pressure in the nozzle chamber is below a predetermined value.

5. A plasma arc torch according to Claim 1, wherein the side openings in the holder are arranged to impart a swirling motion to the gas flowing into the nozzle chamber.

6. A plasma arc torch according to Claim 1, wherein the side openings defined by the holder are located at a position less than 1/2 the length of the holder along the longitudinal axis from the front face of the holder.

7. A plasma arc torch according to Claim 1, wherein the upper tubular member defines a threaded portion and the holder defines a threaded portion for threadably securing the holder to the upper tubular member.

8. An electrode adapted for supporting an arc in a plasma arc torch, comprising:

an upper tubular member defining an internal bore therethrough and a threaded portion at one end thereof; and

a metallic tubular holder defining a longitudinal axis and having a front and rear end, and a transverse end wall closing the front end, the transverse end wall having a front face and defining a cavity formed in the front face extending rearwardly along the longitudinal axis, the rear end defining a central passageway in fluid communication with the internal bore for directing gas to the front end of said holder, said holder further defining a plurality of side openings positioned proximate the front end of said holder that are in fluid communication with the central passageway such that the gas can exit the central passageway only via the side openings positioned proximate the front end of said holder.

9. An electrode according to Claim 8, further comprising a ball valve assembly located in the internal bore of the upper tubular member, said ball valve assembly capable of regulating the gas through the electrode.

10. An electrode according to Claim 8, wherein the side openings in said holder are arranged to impart a swirling motion to the gas exiting the side openings.

11. An electrode according to Claim 8, wherein the plurality of side openings defined by the holder are located at a position less than 1/2 the length of the holder along the longitudinal axis from the front face of the holder.

12. An electrode according to Claim 8, wherein the holder includes a threaded portion for threadably securing the holder to the upper tubular member.

13. A method of operating a plasma arc torch, comprising:

providing an electrode along a longitudinal axis having a metallic holder having a front end and a rear end defining a central passageway, the holder further defining a plurality of side openings that are in fluid communication with the central passageway, and a nozzle positioned proximate the front end of the holder defining a nozzle chamber between the nozzle and the holder; and

directing a flow of gas from the central passageway into the nozzle chamber such that all of the gas is directed through the side openings into the nozzle chamber.

14. A method according to Claim 13, further comprising splitting the flow of gas into at least a primary flow and secondary flow after the flow of gas has entered the nozzle chamber.

15. A method according to Claim 14, further comprising directing the primary flow of gas towards a workpiece through a central bore defined by the nozzle.

16. A method according to Claim 14, farther comprising directing the secondary flow of gas through a plurality of secondary openings defined by the nozzle.

17. A method according to Claim 13, wherein the flow of gas is directed through a flow regulating device in fluid communication with the central passageway.

18. A method according to Claim 13, further comprising detecting pressure in the nozzle chamber, wherein the torch is disabled if the pressure is below a predetermined value.

19. A method according to Claim 13, wherein the gas is directed into the nozzle chamber by swirling the gas via the side openings in the holder.

20. A method according to Claim 13 , wherein all of the gas is directed through the central passageway of the holder a distance more than 1/2 the length of the holder along the longitudinal axis before being directed through the side openings thereof.

21. A method according to Claim 13, further comprising supplying an electrical current to the electrode to create an electrical arc extending from the electrode to the workpiece.

22. A method according to Claim 13, wherein the gas is swirled in the central passageway as the gas is directed to the side openings of the holder.

23. A method of operating a plasma arc torch, comprising:

providing an electrode having a metallic holder defining a central passageway, and a nozzle positioned proximate the front end of the holder and defining a nozzle chamber therebetween;

directing a flow of gas along the central passageway into the nozzle chamber such that all gas supplied into the central passageway enters the nozzle chamber; and

splitting the flow of gas into at least a primary flow and a secondary flow by openings defined in the nozzle.

24. A method according to Claim 23, further comprising directing the primary flow of gas towards a workpiece through a central bore defined by the nozzle.

25. A method according to Claim 23, wherein the flow of gas is directed through a flow regulating device before entering the nozzle chamber.

26. A method according to Claim 23, further comprising detecting pressure in the nozzle chamber, wherein torch is disabled if the pressure is below a predetermined value.

27. A method according to Claim 23, wherein the gas is directed into the nozzle chamber by swirling the gas.

28. A method according to Claim 23, wherein all of the gas is directed along the central passageway of the holder a distance more than 1/2 the length of the holder before being directed to the nozzle chamber.

29. A method according to Claim 23, further comprising supplying an electrical current to the electrode to create an electrical arc extending from the electrode to a workpiece.

30. A method according to Claim 23, wherein the gas is directed along the central passageway to the nozzle chamber by swirling the gas